(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) EP 0 493 972 B1

(12) **EUROPEAN PATENT SPECIFICATION**

(45) Date of publication and mention of the grant of the patent:
19.02.1997 Bulletin 1997/08

(51) Int.Cl.[6]: **F16K 27/00**, F15B 13/00

(21) Application number: **91312065.5**

(22) Date of filing: **27.12.1991**

(54) **Manifold valve**

Ventilverteiler

Distributeur modulaire

(84) Designated Contracting States:
DE FR GB IT

(30) Priority: **29.12.1990 JP 417645/90**

(43) Date of publication of application:
08.07.1992 Bulletin 1992/28

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EP 0 493 972 B1

Printed by Jouve, 75001 PARIS (FR)

Description

This invention relates to a manifold valve comprising a changeover valve attachable to a subsoleplate or a manifold base according to the preamble of claim 1.

A conventional manifold valve usually comprises, as shown in Fig. 1 of the accompanying drawings, a changeover valve 1 that is attached to a manifold base 5 etc. by means of bolts 4 that are screwed into tapped holes 6 in the manifold base 5 through holes 3 provided along both sides of a valve body 2.

To permit a sealing member 7 interposed between the valve 1 and manifold base 5 to function properly, the valve 1 is usually attached with two to four bolts 4. Three bolts are used in the example shown in Fig. 1.

Figs. 2 and 3 of the accompanying drawings show an example of the changeover valve 1 just described in more detail. The valve body 2 has an inlet port P for a pressurized fluid, such as compressed air, outlet ports A and B, exhaust ports EA and EB, and an axial valve port 11 to provide communication therebetween, with a pilot solenoid valve 9 and a cover 10 attached to both ends thereof by appropriate means. A spool 12 sliding through the valve port 11 switchingly establishes communication between the port P and the ports A and B and between the ports A and B and the ports EA and EB, depending on the driving force of a piston 13 on which the pilot fluid pressure supplied through the pilot solenoid valve 9 works and the force applied by a coil spring 14 interposed between the spool 12 and the cover 10.

As is obvious from Fig. 3, the bolt holes 3 provided along both sides of the valve body 2 increase the thickness of the side wall 2a on both sides of the valve port 11, which, in turn, limits the effective cross-sectional area of the fluid passage (valve port 11) that governs the basic performance of the valve 1.

Though this problem can be solved by increasing the width W of the valve body 2, this solution creates a new problem by increasing the size and weight of the valve 1.

Specification DE A 1 211 453, upon which the preamble of claim 1 is based, shows an anlogous arrangement having similar disadvantages where a projection on one part engages in a corresponding recess in the other and the parts are held together by a wing nut or the like screwed onto a screw bolt projecting from one part.

Recently many valves are often mounted on a manifold base to permit their integral control. In such plural mounting, larger valves necessitating a longer manifold base are at a disadvantage.

Furthermore, the use of bolts 4 is not only inefficient as their fastening and unfastening takes time but also lowers the reliability of mounting when they are not adquately tightened.

An object of this invention is to provide a manifold valve that has a valve port of larger diameter relative its valve body and is available in a smaller size than conventional while maintaining the size of the fluid passage.

According to the invention there is provided a manifold valve comprising a valve body having a valve port in which a spool is slidably accommodated for switching pressurized fluid between passages, in the valve body, a manifold base to which the valve is to be attached, the manifold base having ducts aligned with the passages when the valve and base are attached, and means for locking the valve to the base, characterised in that the means for locking the valve to the base comprise a first lock mechanism engageable with a first engaging mechanism on the valve body, a second lock mechanism engageable with a second engaging mechanism on to valve body, and a connecting member connecting the first and second lock mechanisms, the second lock mechanism being locked to the second valve body engaging mechanism via the connecting member by the operation of the first lock mechanism engaging the first valve body engaging mechanism.

In a manifold valve according to the invention the valve body is fastened to a manifold base by clamping at the front and rear ends thereof, thereby eliminating the need for the use of bolts.

Therefore, the walls on both sides of the valve port need have no holes to pass bolts for fastening the valve body to the manifold base and so the side walls can at least be made thinner than a valve having bolt holes, within the limit in which the strength thereof is high enough to withstand the pressure of a pressurized fluid flowing through the valve.

Also, the walls on both sides of the valve port can be at least made thinner by the design margin that has conventionally been added to permit the provision of bolt holes.

In the manifold valve just described, the thickness of the walls on both sides of the valve port need not be larger than the width required for providing an adequate sealing between the surface thereof perforated with ports and the manifold base when the ports are formed by extending the lines tangential to the inner surface of both side walls substantially parallel to each other.

All this permits increasing the diameter of the valve port and the effective cross-sectional area of the fluid passage without increasing the width of the valve body, or reducing the width of the valve body without increasing the effective cross-sectional area of the fluid passage, thereby reducing the size and weight of the entire valve.

The manifold valve according to the invention can have a reduced axial length that permits the same amount of the pressurized fluid to flow with a shorter stroke of the spool.

To permit this installation, it is preferable for the subsoleplate or manifold base to have a clamp at the front end of the valve mounting surface thereon, a lock switchable between the locking and releasing positions at the rear end thereof and a device for switching the

position of the lock from the front end of the valve mounting surface, and the valve to be mounted thereon to have a pair of recesses to engage with the clamp and the lock in the locking position.

To be more specific, the device for switching the position of the lock from the front end of the valve mounting surface comprises a control bolt, a cam moved by the control bolt, a lock lever to transmit the motion of the cam to the lock, and a clamp that is fastened by means of the control bolt meshing with the cam.

After switching the lock into the releasing position by turning the control bolt, the valve is placed on the mounting surface of the manifold base, with one recess therein engaged with the clamp. Then, the lock switched into the locking position clamps the valve on the mounting surface. Thus, the valve is fastened and released by means of the control bolt provided at the front end of the manifold base. This assures easier operation and steadier installation, with higher efficiency and greater reliability, than conventional fastening with bolts.

Furthermore, a power supplying socket may be provided at the rear end of the valve mounting surface of the manifold base and a power receiving socket on the valve, each socket having a guide surface to establish a contact between the two sockets when the valve is fastened to the manifold base. Thus, the contacting guide surfaces on the power supply and receiving sockets establish an electric connection between therebetween simultaneously with the fastening of the valve to the manifold base.

The invention will now be described, by way of example, with reference to the accompanying drawings, in which

Fig. 1 is a perspective view showing how a conventional valve is fastened to a conventional manifold base.

Fig. 2 is a longitudinal cross-sectional view of the same valve.

Fig. 3 is a transverse cross-sectional view of the same valve.

Fig. 4 is a longitudinal cross-sectional view showing the principal parts of a preferred embodiment of this invention, with a pilot solenoid valve mounted on a manifold base.

Fig. 5 illustrates the size of a valve port in a valve according to this invention.

Fig. 6 is a longitudinal cross-sectional view of a manifold base according to this invention.

Fig. 7 is an exploded perspective view of a manifold base according to this invention.

Fig. 8 is an overall perspective view of a manifold valve according to this invention, with a part thereof cut open.

Figs. 9 and 10 illustrate how a valve according to this invention is fastened to a manifold base.

In a preferred embodiment of this invention shown in Fig. 4, a valve 21 is a five-port valve with a fluid passage switching function that is essentially analogous to the valve 1 shown in Figs. 1 to 3.

The valve body 22 of the valv 21 has a port P to supply a pressurized fluid, such as compressed air, outlet ports A and B, exhaust ports EA and EB, and an axial valve port 23 to communicate the individual ports, with one end thereof connected to a pilot solenoid valve 24 through an adapter 25 and the other end thereof closed with a cover 26. A spool 27 slides in the valve port 23 between a position to bring ports P and A and ports B and EB into communication and a position to bring ports P and B and ports A and EA into communication, depending on the driving force of a piston 28 on which the pilot fluid pressure supplied through the pilot solenoid valve 24 works and the force applied by a coil spring 29 interposed between the spool 27 and the cover 26.

This invention is not limited to the preferred embodiment just described, but can be embodied in other types of valves so long as they have a plurality of ports and are attachable to a manifold base or the like.

The valve body 22 of the valve 21 has no bolt holes to pass fastening bolts. As can be clearly seen from Fig. 5, the thickness of the walls 22a on both sides of the valve port 23 extending in the axial direction of the spool 27 is reduced to a minimum, or a value close thereto, within the limit in which the strength to withstand the pressure of compressed air or other fluid passing through the valve body 22 remains unimpaired. To be mote specific, the side walls 22a are at least made thinner than in a valve having bolt holes, or by the design margin that has conventionally been added to permit the provision of bolt holes, within the limit described above.

The side walls 22a may have a thickness to meet the following requirement, but, even then, the thickness thereof can be made thinner than in a valve having bolt holes.

When the individual ports in a die-cast valve body 22 are formed by extending the lines tangential to the inner surface of the side walls 22a substantially parallel to each other, the thickness of the side walls 22a is also limited by the width required for providing an adequate sealing between a surface of the valve body perforated with the ports and a manifold base. The width required for sealing, which varies with coefficients representing the properties of the sealing material, the pressure of the fluid, the fastening pressure applied on the sealed surfaces and other factors, depends on the service conditions of the valve.

As there is no bolt holes in the walls 22a on both sides of the valve port 23, the effective cross-sectional area of the fluid passage can be increased by increasing the diameter of the valve port 23, or the size of the valve 21 can be reduced by reducing the width of the valve body 22. The following paragraphs describe how the diameter of the valve port can be increased or the size of the valve body reduced in the valve body 22 shown in Fig. 5 whose width is equal to the width W of the conventional valve body 2 shown in Fig. 3.

When the valve port 23 in the valve body 22 has a diameter D and a cross-sectional area S, the side walls

22a have a thickness ℓ large enough to withstand the pressure of the fluid flowing therethrough, whereas the valve port 11 in the valve body 2 has a diamet[redacted] cross-sectional area S_1, the bolt holes 3 have a d[redacted] d, the side walls 2a have a thickness ℓ large enough to withstand the pressure of the fluid flowing therethrough and a thickness ℓ_1 large enough to permit the fastening with bolts 4, an increment ΔS in the cross-sectional area of the valve port 23 is expressed as

$$\Delta S = S - S_1 = \pi/4(D^2 - D_1^2)$$

If

$$D_1 = D - 2(\ell_1 + d),$$

$$\Delta S = \pi(D - \ell_1 - d)(\ell_1 + d)$$

If the valve ports 23 and 11 have the same diameter, the width of the valve body 22 can be made smaller than that of the valve body 2 by $2(\ell_1 + d)$.

When, for example, the diameter D of the valve port is 20 mm, the diameter d of the bolt holes is 3.5 mm and the thickness ℓ_1 of the side wall to permit bolt fastening is 1.5 mm, the effective cross-sectional area of the fluid passage increases by 235.5 mm^2.

As the cross-sectional area S of the valve port 23 is 314 mm^2, the rate of increase is expressed as

$$S/S_1 = S/(S - \Delta S) \fallingdotseq 4$$

Thus, if the valve ports 23 and 11 have the same diameter, the width of the valve body 22 can be made thinner than that of the valve body 2 by approximately 10 mm.

This results in a fluid passage having a larger cross-sectional area to permit the flow of a large amount of pressurized fluid, which, in turn, permits reducing the stroke of the spool and, therefore, the axial length of the valve body 22.

When the effective cross-sectional area of the fluid passage is kept unchanged, a reduction in the width of the valve body 22 leads to a reduction in the size and weight of the valve 21.

Referring now to Figs. 4 and 6 to 8, the construction of a manifold base 31 and a fastening mechanism to hold the valve 21 in position will be described in the following.

The valve 21 is made thinner by reducing the thickness of the valve body 22 by reducing the thickness of the walls 22a on both sides of the valve port 23 within the limit in which the strength to withstand the pressure of the fluid passing therethrough remains unimpaired. As this leaves no space to insert bolts for fastening the valve body to the manifold base, the valve body is fastened to the manifold base by clamping at the front and rear ends thereof.

The manifold valve being discussed comprises a manifold base 31, a valve 21 to be attached to a mounting surface 31a of the manifold base 31, and a power supply box 33 attached to the rear end of the manifold base 31. As shown in Fig. 8, a desired number of manifold bases 31 are joined together, with the contact surfaces 31b on both sides thereof kept in contact with each other and an end plate 34 placed at each end of the group of manifold bases 31. The manifold bases 31 are integrally joined together by means of a tie rod 35 passed through a plurality of rod holes 35, as shown in Fig. 7.

An inlet duct 37, outlet ducts 38a and 38b, and exhaust ducts 39a and 39b, through which compressed air or other pressurized fluid passes, open in a valve mounting surface 31a of the manifold base 31. The inlet duct 37and the exhaust ducts 39a and 39b individually communicate with a supply passage 40 and exhaust passages 41a and 41b that pass through in the direction in which the manifold bases 31 are joined together. The individual passages are sealed by a gasket 42 disposed between the adjoining contact surfaces 31b. The outlet ducts 38a and 38b individually communicate with outlets 43a and 43b provided in the front end surface 31c of the manifold base 31, with a one-touch pipe joint 44 attached to each of the outlets 43a and 43b by means of a fastening spring 45. Elastically fitted in a groove 44a cut around the one-touch pipe joint 44, the fastening spring 45 keeps the pipe joint 44 in position in a bore provided in the manifold base 31.

The manifold base 31 just described has an insert hole 49 that opens diagonally forward to hold a control bolt 62 to be described later in a front end engaging mechanism 46 at the front end of the valve mounting surface 31a. On the inner side, the insert hole 49 opens into the contact surfaces 31b of the individual manifold bases. A rear end engaging mechanism 48 at the rear end of the valve mounting surface 31a has a recess 50 that opens upward.

The insert hole 49 in the front end engaging mechanism 46 has a groove 52 cut around the wall thereof, and a metal clamp 60 has a base end fit in the groove 52 and a front hook 60a projecting above the valve mounting surface 31a. The control bolt 62 is loosely fitted in the metal clamp 60, with a threaded part 62a thereof screwed into a threaded hole 61a in a cam 61 fitted in the insert hole 49 in the front end engaging mechanism 46. The control bolt 62 has a thread-less thinner part 62b at the forward end of the threaded part 62a screwed into the threaded hole 61a in the cam 61. When the thinner part 62b is inside the threaded hole 61a in the cam 61, the control bolt 62 is slidable with respect to the metal clamp 60 and cam 61. The cam 61 also has engaging shoulders 61c and 61d to engage with engaging corners 54 and 55 in the front and rear

walls in the insert hole 49 and a cam groove 61b to transmit the motion thereof to the tear end engaging mechanism 48.

The rear end engaging mechanism 48 has a metal lock 65 that is swingably fitted in the recess 50 with a pin 64. The metal lock 65 has a hook 65a projecting above the valve mounting surface 31a of the manifold base and is always urged toward the locking position by a spring 66.

One of the contact surfaces 31b of the manifold base 31 has a groove 48 that extends between the front end engaging mechanism 46 and the rear end engaging mechanism 48, with a lock lever 68 slidably fitted therein. While the front bent end of the lock lever 68 engages with the cam groove 61b, the rear bent end thereof engages with a hole 65b in the metal lock 65. Thus, the control bolt 62 moves the metal lock 65 through the cam 61 and lock lever 68.

The valve body 22 has engaging recesses 74 and 75 to engage with the hooks 60a and 65a on the metal clamp 60 and metal lock 65. The engagement of the hooks 60a and 65a puts the valve 21 in a given position on the valve mounting surface 31a of the manifold base 31, thereby individually bringing the corresponding openings into communication with each other.

A power receiving socket 78 to supply electric power to the solenoid of the pilot solenoid valve 24 is attached to the adapter 25 between the pilot solenoid valve 24 and valve body 22. The power receiving socket 78 has a plurality of power receiving pins 79 extending downward and a guide 80 that surround the periphery thereof. On the inside of the guide 80 is provided a tapered guide surface 81 that opens flaringly.

The power supply box 33 to supply electric power to the power receiving socket 78 has a projection 82 fitted into the manifold base 31 and an engaging claw 83 that elastically engages with an engaging recess 83a in the manifold base 31. The power supply box 33 is attached to the manifold base 31 by means of the projection 82 and claw 83. The power supply box 33 has an opening 84 that is provided in a position opposite to the power receiving socket 78 mounted thereon, with a power supply plug 85 having a required number of power supply terminals 86 and an enclosing tapered guide surface 87 attached thereto.

Reference numerals 90 and 91 in the figure designate gaskects attached to the valve mounting surface 31a and opening 84.

Referring now to Figs. 9 and 10, steps of mounting of the valve 21 onto the valve mounting surface 31a of the manifold base 31 and dismounting therefrom will be described.

When the control bolt 62 is pushed into the insert hole 49 while the metal lock 65 is urged toward the locking position by the spring 66, the cam 61 descends as shown in Fig. 9. As the cam groove 61b then presses the lock lever 68, the metal lock 65 swings to the releasing position against the urging force of the spring 66.

When the valve 21 is tilted as shown in Fig. 9 to bring the engaging recess 74 into engagement with the hook 60a, the valve 21 is placed on the valve mounting surface 31a and the control bolt 62 is released, the hook 65a on the metal lock 65 engages with the engaging recess 75 on the valve 21 to clamp the valve 21 on the valve mounting surface 31a.

At the same time, the power receiving socket 78 fits over the power supply plug 85, with the guide surfaces 81 and 88 thereon coming in contact with each other, thereby establishing an electric connection between the power receiving pints 79 and the power supply terminals 86.

When the control bolt 62 is turned to screw the threaded part 62a thereof into the threaded hole 61a in the cam 61 in this condition, the cam 61 is pulled up to bring the engaging shoulders 61c and 61d into engagement with the engaging corners 54 and 55 in the front and rear walls in the insert hole 49, thereby keeping the metal lock 65 in the locking position, as shown in Fig. 10.

To dismount the valve 21, the control bolt 62 is turned in the opposite direction to release the threaded part 62a thereof from the engagement with the threaded hole 61a. The subsequent pressing of the control bolt 62 lowers the cam 61, whereby the lock lever 68 brings the metal lock 65 into the releasing position and out of engagement with the engaging recess 75. Then, the valve 21 is removed from the manifold base 31 by pulling from the rear end thereof and disengaging the hook 60a from the engaging recess 74.

With the manifold valve just described, the valve 21 can be fastened to, and detached from, the manifold base 31 with ease by simply pressing and turning the controlbolt 62 provided in the front end of the manifold base 31. The power supply 65 and the power receiving socket 78 are electrically connected as the guide surfaces 81 and 88 thereof are brought into contact with each other when the valve 21 is mounted on the valve mounting surface 31a from the tilted position.

Claims

1. A manifold valve (21) comprising a valve body (22) having a valve port (P) in which a spool (27) is slidably accommodated for switching pressurized fluid between passages (EP,B,P,A,EA), in the valve body (22), a manifold base (31) to which the valve (21) is to be attached, the manifold base (31) having ducts (39b,38b,37,38a,39a) aligned with the passages (EP,B,P,A,EA) when the valve (21) and base (31) are attached, and means for locking the valve (21) to the base (31), characterised in that the means for locking the valve (21) to the base (31) comprise a first lock mechanism (60) engageable with a first engaging mechanism (74) on the valve body (22), a second lock mechanism (65) engageable with a second engaging mechanism (75) on to

valve body (22), and a connecting member (68) connecting the first and second lock mecha[illegible] (60,65), the second lock mechanism (65) locked to the second valve body engaging [illegible]nism (75) via the connecting member (68) by the operation of the first lock mechanism (60) engaging the first valve body engaging mechanism (74).

2. A manifold valve as claimed in Claim 1 in which the first lock mechanism includes a clamp (60) for engaging with the first engaging mechanism (74).

3. A manifold valve as claimed in Claim 2 in which the first engaging mechanism is a first recess (74) defined at one end portion of the valve body (22) and the clamp (60) is engaged with the first recess (74).

4. A manifold valve as claimed in Claim 3 in which the clamp (60) includes a hook member at a distal end thereof which is engageable with the first recess (74).

5. A manifold valve as claimed in any preceding claim in which the first lock mechanism (60) includes a fastening member (62) to swingably move the connecting member (68).

6. A manifold valve as claimed in Claim 5 in which the first lock mechanism (60) includes a cam member (61) which receives the fastening member (62) and engages one end of the connecting member (68).

7. A manifold valve as claimed in any preceding claim in which the second lock mechanism has a lock member (65) for engaging with the second valve body engaging mechanism (75).

8. A manifold valve as claimed in Claim 7 in which the second valve body engaging mechanism is a second recess (75) defined at a second end portion of the valve body (22) opposite to the first engaging mechanism (74), and the second lock member (65) is engaged with that second recess (75).

9. A manifold valve as claimed in Claim 8 in which the second lock member (65) includes a hook portion (65a) at one end thereof which is engageable with the second recess (75).

10. A manifold valve as claimed in any of claims 7 to 9 further comprising a pin member (64) mounted within the manifold base (31), the lock member (65) being pivotally mounted about the pin member (64).

11. A manifold valve as claimed in any of claims 7 to 10 in which the lock member (65) has a hole defined therein to receive the end of the connecting member (68).

12. A manifold valve as claimed in any of claims 7 to 11 in which the lock member (65) is biased to be engaged with the valve (21).

13. A manifold valve as claimed in any preceding claim in which the manifold base (31) and the valve body (22) have respective guide surfaces.

14. A manifold valve as claimed in Claim 13 in which the guide surfaces are formed on a power receiving socket on the valve and a power supply socket on the manifold base.

15. A system of manifold valves comprising a plurality of manifold valves according to any preceding claim.

Patentansprüche

1. Ventilverteiler (21) mit einem Ventilkörper (22), der eine Ventilöffnung (P) aufweist, in welcher eine Spule (27) gleitend aufgenommen ist, um unter Druck stehendes Fluid zwischen Durchgängen (EP, B, P, A, EA) in dem Ventilkörper (22) zu schalten, mit einer Verteilerbasis (31), an welcher das Ventil (21) zu befestigen ist, wobei die Verteilerbasis (31) Führungen (39b, 36b, 37, 38a, 39a) aufweist, die mit den Durchgängen (EP, B, P, A, EA) ausgerichtet sind, wenn das Ventil (21) und die Basis (31) befestigt sind, und mit Mitteln zum Verriegeln des Ventils (21) an der Basis (31), dadurch **gekennzeichnet**, daß die Mittel zum Verriegeln des Ventils (21) an der Basis (31) einen ersten Verriegelungsmechanismus (60) der mit einem ersten Eingriffsmechanismus (74) mit dem Ventilkörper (22) in Eingriff bringbar ist, einen zweiten Verriegelungsmechanismus (65), der mit einem zweiten Eingriffsmechanismus (75) mit dem Ventilkörper (22) in Eingriff bringbar ist, und ein Verbindungselement (68) aufweisen, das die ersten und zweiten Verriegelungsmechanismen (60, 65) verbindet, wobei der zweite Verriegelungsmechanismus (65) durch die Wirkung des ersten Verriegelungsmechanismus (60), welcher an dem ersten Ventilkörpereingriffsmechanismus (74) angreift, über das Verbindungselement (68) mit dem zweiten Ventilkörpereingriffsmechanismus (75) verriegelt wird.

2. Ventilverteiler nach Anspruch 1, bei dem der erste Verriegelungsmechanismus eine Klammer (60) zum Angreifen an dem ersten Eingriffsmechanismus (74) aufweist.

3. Ventilverteiler nach Anspruch 2, bei dem der erste Eingriffsmechanismus eine erste Aussparung (74) ist, die an einem Endabschnitt des Ventilkörpers (22) ausgebildet ist, und bei dem die Klammer (60)

mit der ersten Aussparung (74) in Eingriff steht.

4. Ventilverteiler nach Anspruch 3, bei dem Kl[illegible] (60) ein Hakenelement an ihrem entfernte[illegible] aufweist, welches mit der ersten Aussparun[illegible] in Eingriff bringbar ist.

5. Ventilverteiler nach einem der vorhergehenden Ansprüche, bei dem der erste Verriegelungsmechanismus (60) ein Befestigungselement (62) aufweist, um das Verbindungselement (68) schwingend zu bewegen.

6. Ventilverteiler nach Anspruch 5, bei dem der erste Verriegelungsmechanismus (60) ein Kurvenelement (61) aufweist, welches das Befestigungselement (62) aufnimmt und an einem Ende des Verbindungselements (68) angreift.

7. Ventilverteiler nach einem der vorhergehenden Ansprüche, bei dem der zweite Verriegelungsmechanismus ein Verriegelungselement (65) zum Angriff an dem zweiten Ventilkörpereingriffsmechanismus (75) aufweist.

8. Ventilverteiler nach Anspruch 7, bei dem der zweite Ventilkörpereingriffsmechanismus eine zweite Aussparung (75) ist, die an einem zweiten Endabschnitt des Ventilkörpers (22) gegenüber dem ersten Eingriffsmechanismus (74) ausgebildet ist, und bei dem das zweite Verriegelungselement (65) mit der zweiten Aussparung (75) in Eingriff steht.

9. Ventilverteiler nach Anspruch 8, bei dem das zweite Verriegungselement (65) einen Hakenabschnitt (65a) an seinem einen Ende aufweist, welcher mit der zweiten Aussparung (75) in Eingriff bringbar ist.

10. Ventilverteiler nach einem der Ansprüche 7 bis 9, außerdem mit einem Stiftelement (64), das innerhalb der Verteilerbasis (31) angebracht ist, wobei das Verriegelungselement (65) schwenkbar um das Stiftelement (64) angebracht ist.

11. Ventilverteiler nach einem der Ansprüche 7 bis 10, bei dem das Verriegelungselement (65) eine darin ausgebildete Öffnung zur Aufnahme des Endes des Verbindungselements (68) aufweist.

12. Ventilverteiler nach einem der Ansprüche 7 bis 11, bei dem das Verriegelungselement (65) vorgespannt ist, um mit dem Ventil (21) in Eingriff zu treten.

13. Ventilverteiler nach einem der vorhergehenden Ansprüche, bei dem die Ventilbasis (31) und der Ventilkörper (22) jeweilige Führungsoberflächen aufweisen.

14. Ventilverteiler nach Anspruch 13, bei dem die Führungsflächen an einer kraftaufnehmenden Hülse an dem Ventil und einer Kraftversorgungshülse an der Verteilerbasis ausgebildet sind.

15. System von Ventilverteilern mit einer Vielzahl von Ventilverteilern gemäß einem der vorhergehenden Ansprüche.

Revendications

1. Distributeur (21) comprenant un corps (22) de distributeur comportant un orifice (P) de distributeur dans lequel un tiroir (27) est logé de façon coulissante pour permuter un fluide sous pression entre des passages (EP, B, P, A, EA), dans le corps (22) de distributeur, une base (31) de distributeur à laquelle le distributeur (21) est fixé, la base (31) de distributeur comportant des conduits (39a, 36b, 37, 38a, 39a) alignés avec les passages (EP, B, P, A, EA) quand le distributeur (21) et la base (31) sont fixés mutuellement, et un moyen pour verrouiller le distributeur sur la base, caractérisé en ce que le moyen pour verrouiller le distributeur (21) sur la base (31) comprend un premier mécanisme de verrouillage (60) pouvant venir en prise avec un premier mécanisme d'encliquetage (74) du corps (22) de distributeur, un second mécanisme de verrouillage (65) pouvant venir en prise avec un second mécanisme d'encliquetage (75), et un élément d'accouplement (66) raccordant les premier et second mécanismes de verrouillage (60, 65), le second mécanisme de verrouillage (65) étant verrouillé sur le second mécanisme (75) d'encliquetage du corps de valve, par l'intermédiaire de l'élément d'accouplement (68), du fait de la venue en prise du premier mécanisme de verrouillage (60) avec le premier mécanisme d'encliquetage (74) du corps de distributeur.

2. Distributeur selon la revendication 1, dans lequel le premier mécanisme de verrouillage comprend une pièce de blocage (60) destinée à venir en prise avec le premier mécanisme d'encliquetage (74).

3. Distributeur selon la revendication 2, dans lequel le premier mécanisme d'encliquetage est un premier évidement (74) défini à une première partie d'extrémité du corps (22) de distributeur et la pièce de blocage (60) est en prise avec le premier évidement (74).

4. Distributeur selon la revendication 3, dans lequel la pièce de blocage (60) comprend un élément d'accrochage à son extrémité distale qui peut venir en prise avec le premier évidement (74).

5. Distributeur selon l'une quelconque des revendications précédentes, dans lequel le premier mécanisme de verrouillage (60) comprend un élément de fixation (62) pour déplacer de façon pivotante l'élément d'accouplement (68).

6. Distributeur selon la revendication 5, dans lequel le premier mécanisme de verrouillage (60) comprend un élément formant came (61) qui reçoit l'élément de fixation (62) et porte contre une extrémité de l'élément d'accouplement (68).

7. Distributeur selon l'une quelconque des revendications précédentes, dans lequel le second mécanisme de verrouillage comporte un élément de verrouillage (65) destiné à venir en prise avec le second mécanisme d'encliquetage (75) de corps de distributeur.

8. Distributeur selon la revendication 7, dans lequel le second mécanisme d'encliquetage du corps de distributeur est un second évidement (75) défini dans la seconde partie d'extrémité du corps (22) de distributeur située en face du premier mécanisme d'encliquetage (74) et le second élément de verrouillage (65) est en prise avec le second évidement (75).

9. Distributeur selon la revendication 8, dans lequel le second élément de verrouillage (65) comprend, à une de ses extrémités, une partie d'accrochage (65a) qui peut venir en prise avec le second évidement (75).

10. Distributeur selon l'une quelconque des revendications 7 à 9 comprenant, en outre, un élément formant axe (64) monté dans la base (31) de distributeur, l'élément de verrouillage (65) étant monté de façon pivotante autour de l'élément formant axe (64).

11. Distributeur selon l'une quelconque des revendications 7 à 10, dans lequel l'élément de verrouillage (65) comporte un trou qui y est formé de manière à recevoir l'extrémité de l'élément d'accouplement (68).

12. Distributeur selon l'une quelconque des revendications 7 à 11, dans le quel l'élément de verrouillage (65) est sollicité de manière à être en prise avec le distributeur (21).

13. Distributeur selon l'une quelconque des revendications précédentes, dans lequel la base (31) de distributeur et le corps (22) de distributeur ont des surfaces de guidage respectives.

14. Distributeur selon la revendication 13, dans lequel les surfaces de guidage sont formées sur une prise femelle de réception de courant se trouvant sur le distributeur et sur une prise femelle d'alimentation en courant se trouvant sur la base de distributeur.

15. Système de distributeurs comprenant une multiplicité de distributeurs selon l'une quelconque des revendications précédentes.

FIG. 1 PRIOR ART

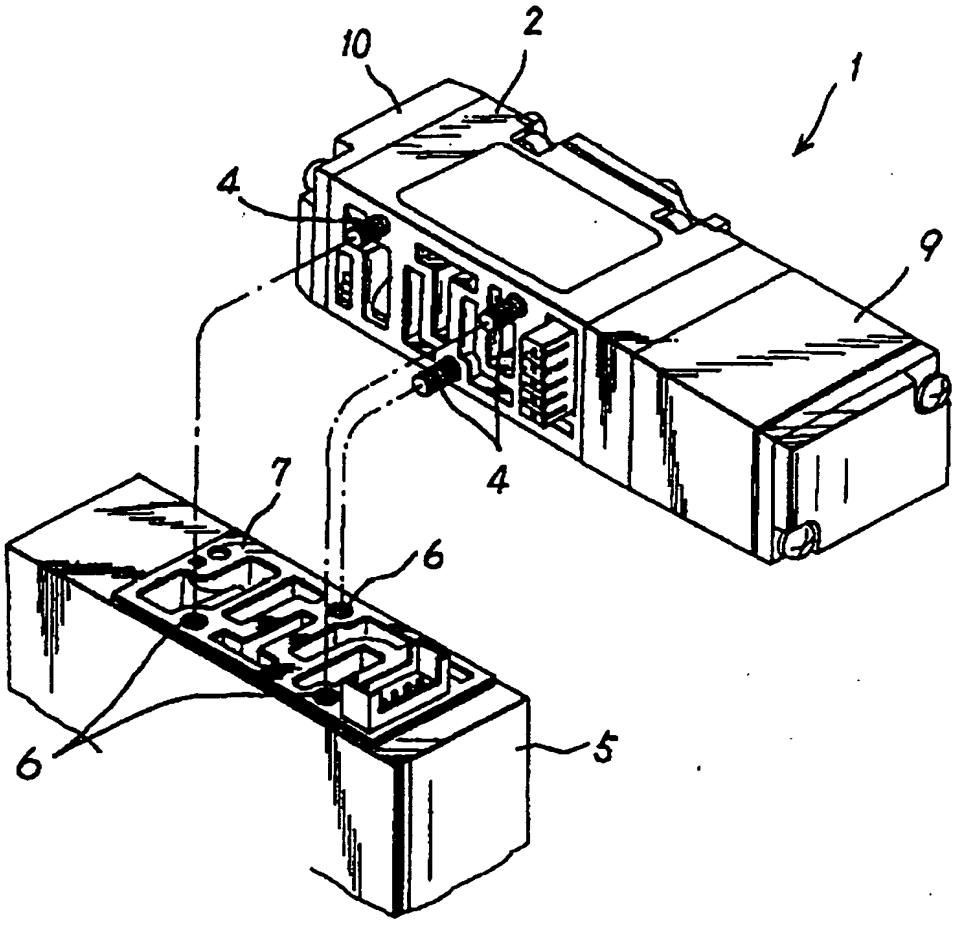


FIG. 2 PRIOR ART

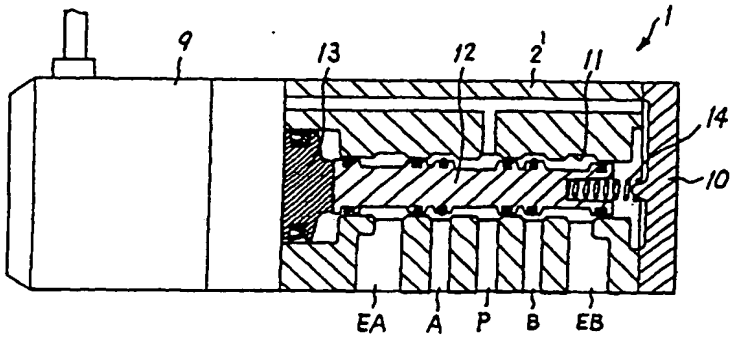


FIG. 3 PRIOR ART

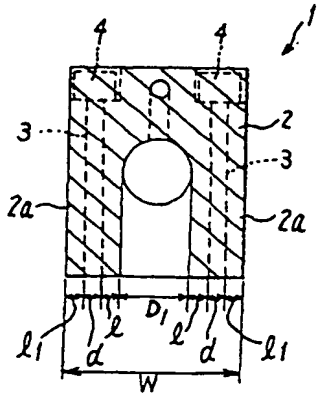


FIG. 4

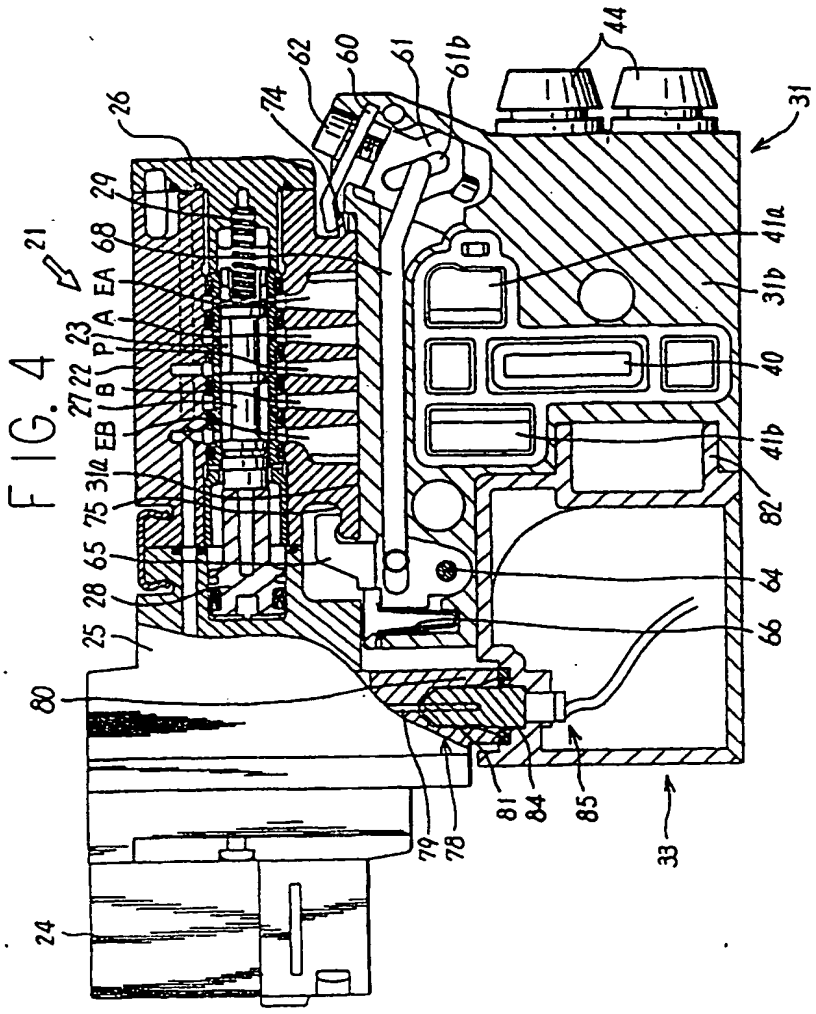
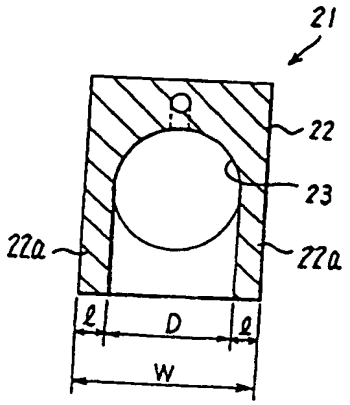

44
62
60
61
61b
74
26
31
29
21
68
41a
EA
A
23
P
40
22
B
27
EB
41b
31a
82
75
65
64
28
66
25
80
81
84
85
79
78
33
24

FIG. 5



G. 6

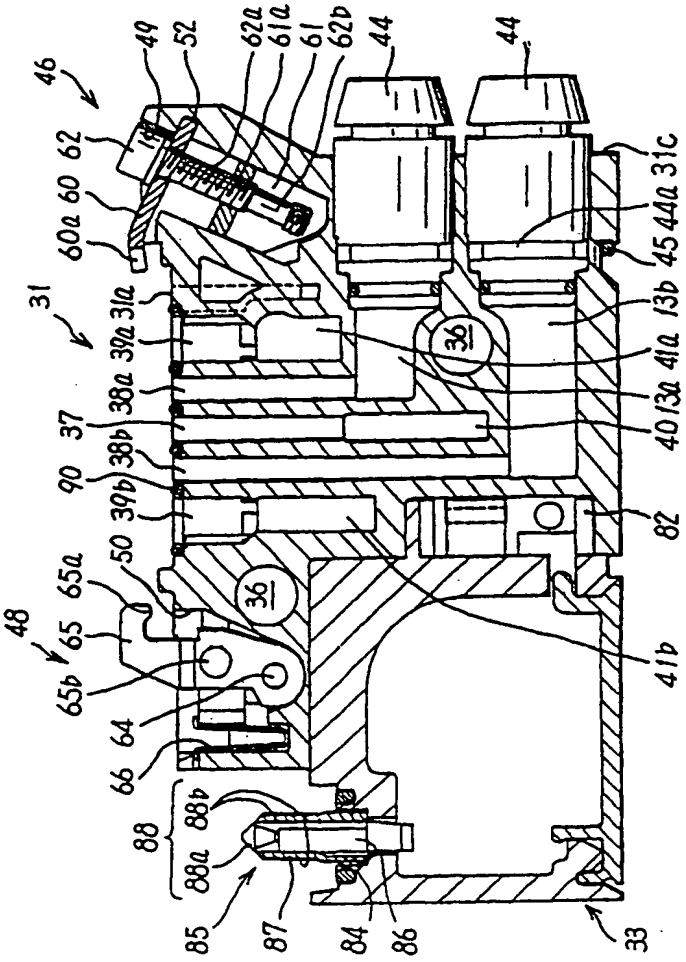
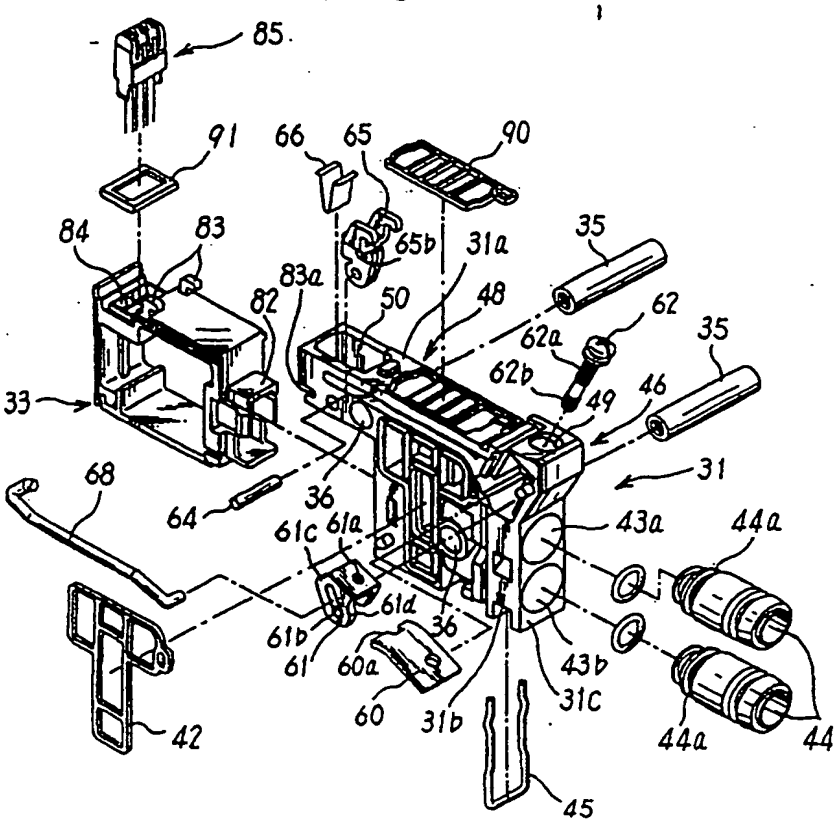

46
49
52
62a
61a
61
62b
44
44
62
60
60a
31c
44a
45
31
31a
13b
39a
36
41a
38a
13a
37
40
38b
90
39b
82
50
65a
36
48
65
41b
65b
64
66
88
88b
88a
85
87
84
86
33

FIG. 7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91
66
65
90
84
83
65b
31a
35
83a
82
50
48
62
62a
35
62b
49
46
33
68
64
36
31
61c
61a
43a
44a
61d
61b
36
61
60a
43b
31c
60
31b
42
44a
44
45

FIG. 8

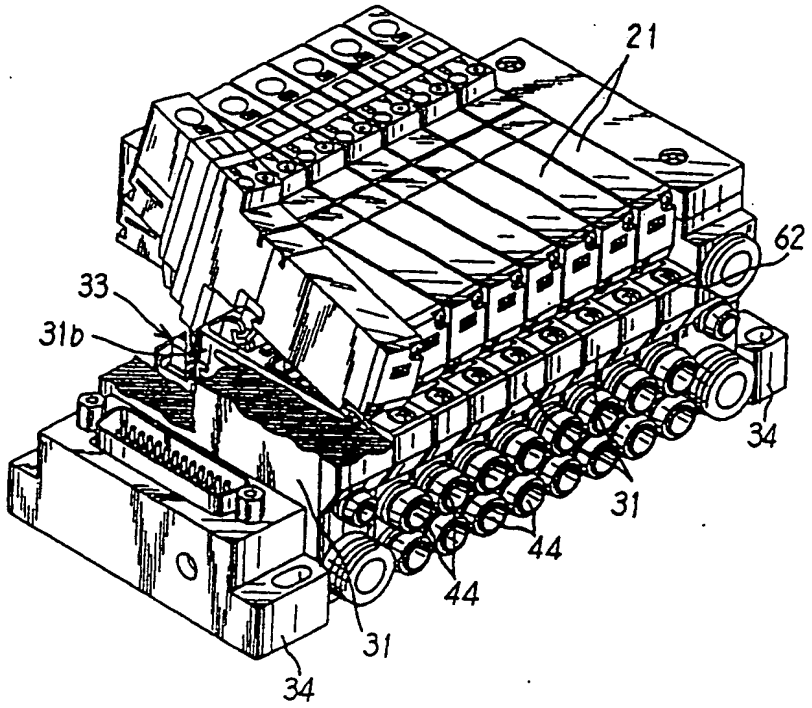


FIG. 9

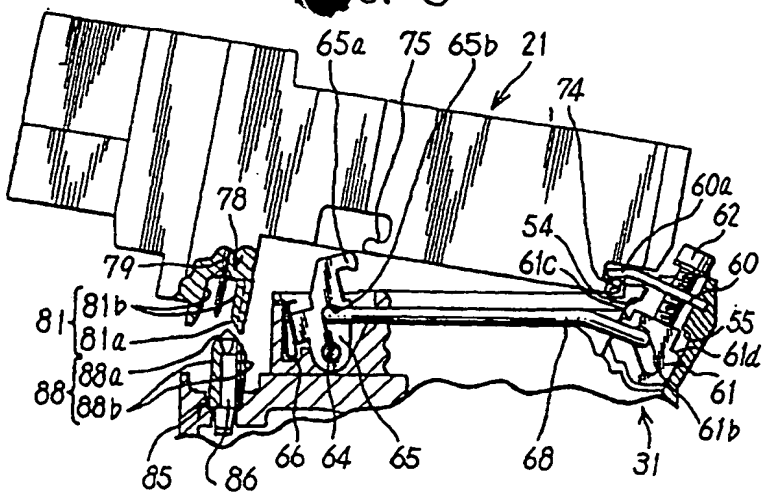
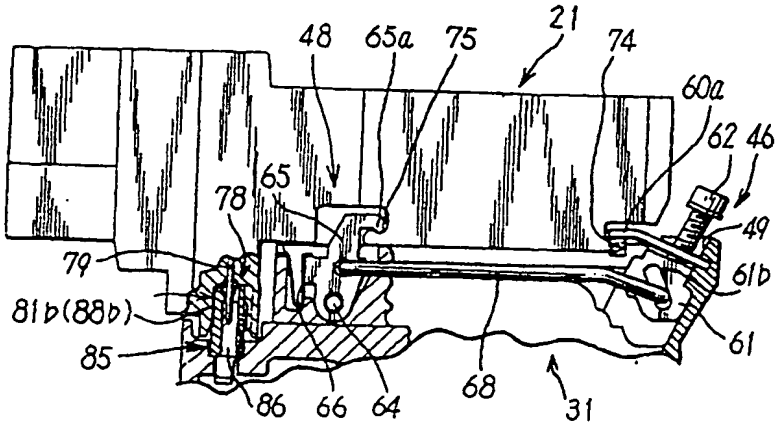

65a
75
65b
21
74
78
60a
62
54
61c
60
79
81b
81
81a
55
88a
88
88b
61d
61
61b
85
86
66
64
65
68
31

FIG. 10


48
65a
75
21
74
60a
62
46
65
78
49
79
61b
81b(88b)
61
85
86
66
64
68
31